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Q&A: NSF Head on His Own Plans, DOD Science Support, Etc.

Following the monthly meetings of the National Science Board, policy body of the National Science Foundation, NSF Director Erich Bloch usually holds a free-form discussion with reporters, along with the Board Chairman, Mary L. Good, President-Engineered Research Materials, Allied-Signal Corporation. The latest encounter was on October 14. Following are excerpts, transcribed and edited by SGR.

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Q. *An editorial in* Science *[October 7, by Richard C. Atkinson, a former NSF Director who is Chancellor, UC San Diego] urges the next President to keep you on as NSF Director. What do you say about that?*

Bloch. I don't know if Atkinson is a friend or an enemy.

Q. *If asked, would you stay?*

Bloch. First of all, I have a six-year appointment that's not up until 1990. I'll leave when I think I'm no longer useful. I don't know when that is. I have no intention between right now and the foreseeable future to change.

Good. From the Board's side, without respect to what the new Administration's going to do, there is no question that having a Director who has been here for a reasonable period of time has made a big, big plus for the Foundation. We really did have some serious problems with this sort of revolving door that we had had. Because it's destabilizing on the Foundation staff and surely it is a difficult problem for the Board. The kinds of longterm programs—the whole issue of trying to double the budget over a five-year period, planning, and all of those kinds of things—are very, very difficult when you don't have a Director who stays for a reasonable period of time.

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Bloch. It's not only the Director, but it's the Deputy Director, also, and we had a lot of turmoil in that job. And then it's the Assistant Directors. When I came here, we had something like three or four positions which had been open for two years. You can't operate that way. The Assistant Directors are really running the day-to-day affairs of the Foundation.

Q. *Is it customary for the Science Board to make a recommendation to the new Administration about the Director?*

Good. I don't know the answer to that. I suspect that this Board, whether it would make it officially or not, would not be so naive as to *not* attempt to make one, officially or unofficially, at least.

Charles H. Herz [NSF General Counsel]. The [NSF] Act requires a recommendation [to the President] from the Board whenever there's a vacancy for Director.

Q. *What are the current plans for the Science and Technology Centers [a new NSF program for which Congress denied the Administration's request for a five-year, $150-million appropriation. As a result, the program will be operated on the customary year-to-year basis]?*

Bloch. A request from the staff to approve a certain number of centers will be going to the Board in Decem-

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In Brief

The academic pork barrel fared well in the 100th Congress, despite a last-minute rejection of some $46 million "earmarked" in the Pentagon budget for university projects unsought by DOD. All the details haven't been excavated from the deliberately dense text of appropriations reports, but it looks like the total will exceed $150 million for scores of campus construction projects. The appropriations are Congress's answer to the Administration's near-total elimination of money for university buildings.

Six months later, NIH still hasn't delivered on its promise of swift resolution of questions raised at a Congressional hearing about the accuracy of a paper co-authored by Nobel laureate David Baltimore, of MIT (SGR, April 15). In July, NIH officials told SGR that a report from a three-member investigating committee would be delivered to the NIH Director by August 15. But, on September 29, two committee members held a second round of talks with Baltimore and two of his colleagues "to tie down some loose ends," an NIH source says. Delivery of the report is now said to be "days or weeks" away.

With Congress piling funds atop the Administration's requests, NSF has resumed its role as the nation's major source of funds for studies of innovation in science education. But the current amount, $107 million, is paltry relative to the need, says the AAAS Office of Science and Technology Education. "NSF spending is still too small to make much of a difference in a system where science and mathematics teachers are demoralized . . . . The problems are simply too ingrained to be addressed by an occasional summer institute," according to an analysis in the September *Science Education News*, a AAAS newsletter.

Still Legal Limbo for AID Malaria Chief (An Update)

As reported here in detail June 15, the malaria vaccine research program of the US Agency for International Development (AID) encountered serious operational difficulties after its director, James M. Erickson, raised charges of inept performance by the organization hired to administer the program, the American Institute of Biological Sciences (AIBS).

AIBS soon afterwards accused Erickson of sexual harrassment, though the object, or objects, of the alleged harrassment brought no complaint, and several co-workers made affidavits saying they were in a position to know, and were unaware of any offense by Erickson.

Nonetheless, he was subsequently assigned to another job in AID, and in October 1987 was put on administrative leave with pay, where he still is. Last month, after he took AID to federal court to obtain a resolution of his case, AID responded by proposing to suspend him without pay for 14 days on the still unsubstantiated charges of sexual harrassment. In addition, it accused Erickson of violating "employee standards of conduct" and "Lack of candor in responding to allegations of sexual harrassment." AID also says that Erickson is under investigation by the Justice Department and the AID Inspector General for criminal acts allegedly committed while he headed the malaria vaccine program.

Investigated for Two Years

That investigation has been under way for close to two years, without producing any official charges. Meanwhile, AID officials refuse to discuss the case, insisting either that it's in the hands of the Justice Department or that they are fearful of violating Erickson's privacy rights—a solicitude that Erickson dismisses as preposterous.

Erickson has repeatedly accused AID of withholding documents that a Federal District judge ordered it to produce and of failing to respond to pre-trial interrogatories on relevant matters. In the interrogatories that it answered, AID acknowledged, for example, that it has never investigated the charges of incompetence and misuse of government funds that Erickson brought against the American Institute of Biological Sciences, though many of the malaria researchers dependent on AIBS's administration strongly protested AIBS's performance. AID also acknowledged that it had not read a three-volume investigatory report on Erickson produced under contract to AID by an outside organization—though AID officials had had the report for over six months.

Vaccine Trials—But No Vaccine

From inside the US Agency for International Development, SGR has been provided documentation of further chaos in the long-running AID program to develop a vaccine against malaria, a disease that kills an estimated five million people annually in developing countries.

It comes in a memo dated September 20 from Nancy Pielemeier, Chief of the Health Sector in the AID office of Policy Planning and Coordination. Addressed to Kenneth T. Bart, head of the Directorate for Health in the AID Bureau of Science and Technology, the memo states that the Bureau has spent $3.8 million over the past two years for a malaria vaccine field trial—but no vaccine exists or is in sight, and approval has not been given for proceeding with the trials. The funds are for the first steps in a field-testing program budgeted for $23 million. "The project," Pielemeier wrote, "proposes to establish sites to field test vaccines, although no candidate vaccines are ready for such testing, and will not be for years"—perhaps 5 to 10 years, the memo adds.

Pielemeier wrote that "In 1986, there was considerable optimism that effective malaria vaccines would soon be in hand. However, human trials of prototype vaccines in 1986 and 1987 proved to be disappointing . . . . Simply put, no vaccines are ready for field testing, and will not be ready for years, according to scientists at NIH, Walter Reed, and the CDC." The memo notes, however, that "under the current project design, field stations to test vaccines would be established even though no clinical successes are in hand and no candidate vaccines have been tagged for development." It adds: "This is not a reasonable foundation for a $23 million project."

SGR asked Pielemeier if she had received a response to the memo. She said questions should be addressed to the AID Office of Public Affairs.

Meanwhile, as the scandalous treatment of a highly honored and widely respected government research administrator continues, responsible officials at AID are hiding out from press inquiries. Questions to Erickson's former chief, Nyle C. Brady, head of the AID Bureau for Science and Technology, are invariably shunted to the black hole of the Office of Public Affairs, from whence no answers emerge. An increasingly interesting question is why Brady is hiding out on this case. It's a question that might interest a Congressional committee.—DSG

. . . Disputes "Applied" Science Label for New Centers

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ber. We had over 300 submissions. We scaled that down to 45 or 48, and those are now being sorted out. The submissions that we got ranged from less than a million dollars for a center in the first year to five, six, seven million dollars. We have allocated $25 million for first year funding, and how many centers will come out of that depends on which centers wind up on the list.

Q. *In public discussions, and in the Presidential campaign, the centers have been referred to as "applied centers." Does that bother you?*

Good. Yes it does, because it isn't correct.

Bloch. Careful. That doesn't bother me, because I don't know what the candidates mean. I hope *they* do. What bothers when that's said—and I've seen it in the science press—is that these are *not* applied centers. These are basic-research centers.

Good. I think that, hopefully, that misunderstanding is going to get cleared up, because when you see the centers that finally get approved, if we can get a good description of those out to the public, I think that particular misconstruction is going to go away. Because these are going to be anything but applied. Now you can say perhaps that the Engineering Centers were more applied, but that's what engineering is. And even those are not applied in the sense that most people believe.

Q. *Do you think Congress is going to be disappointed when they find out they are not applied?*

Bloch. No. We explained to Congress very clearly. By the way, we don't call them applied centers. We call them Science and Technology Centers. We described to Congress very clearly what we were after and why and what it's supposed to do. And we focused on basic research, we focused on education, on the connection between industry and the research in universities. So, I don't believe Congress has a different idea.

Q. *In evaluating the centers, did you profit from suggestions from Congress?*

Bloch. We probably got 50 to 100 letters from various Congressional people. Like we always do on any program, telling us, "Make sure you understand that this university or that university has a proposal submitted." But we didn't get any kind of directions with regard to the Science and Technology Centers or the Engineering Research Centers in any of our bills. So, I think Congress behaved very properly.

Q. *President White of the National Academy of Engineering has suggested that the old National Bureau of Standards [newly renamed the National Institute of Standards and Technology (NIST)] should perform some of the industrial-promotion activities of the Japanese Ministry of International Trade and Industry [SGR, October 15].*

Bloch. What he focused on was on the technology aspects. And he cited the NIST as being a very important element.

Q. *He cited a number of technologies supported by MITI, and he said the counterpart projects in the US are supported by the Defense Department. And he went on to say that a military agency is not the suitable place for these, and he suggested that the NIST might be an appropriate place.*

Bloch. Yeah, I think he said that. He deplored the fact, and rightly so, that the [National Science] Foundation hadn't put as much money into engineering as the country should. And I think he's right. Under the circumstances, we did what we had to do and what we could do. Is there a shortfall there? Yes, the country has a shortfall. So, he's absolutely right focusing on that.

Q. *But if it were given the resources, the Foundation could perform those functions. Is that what you're suggesting?*

Bloch. I don't know. They have some functions in the NIST that should not be at the Foundation. Some technology centers could start from that viewpoint and from that basis, rather than from a basic-research or educational basis. So, I wouldn't want to say, yes, we could do the whole thing. I think it would distort somewhat the mission of the Foundation. Since we've got a Bureau of Standards, let's utilize it.

Q. *Are you suggesting that the Foundation is confined to basic research and its role does not extend to applied science and technology?*

Bloch. I think we are closer to the basic-research end than to any other one, and a big portion of our dollars go into it, but not exclusively.

Q. *But given the economic concerns of the country, would it be suitable for the Foundation to expand beyond its traditional basic-research mandate?*

Bloch. I'm not sure. You've got to see who else is in the business. And why they're in the business. Also, the dividing line between basic research and applied re-

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. . . Pentagon Still a Free Rider on Science, Bloch Says

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search is not very clean. It shouldn't be clean.

Good. Particularly in a field that's moving rapidly, it's very difficult to decide what's applied and what's basic. But you have to be very careful about making the NSF handle applied as well as basic. Because we don't have any other [federal] agency that handles basic as a main responsibility. You've got some basic research that goes on in the DOD, but it's mission oriented. And, as everyone around this table knows, their devotion to basic research has fast evaporated. If you look at what they're now doing in 6.1 [the basic-research category in the Defense budget], it's very debatable as to whether they really have any commitment in that area at all.

Q. *Regarding DOD's new fellowship program [SGR, October 15]. Congress said they should coordinate with NSF. Wouldn't it be easier if Defense just gave the $10 million to NSF and let you do it?*

Educating the Pentagon!

Bloch. No. I think it's very important that the Defense Department be involved in the process. They will learn from it, they will get the flavor of it. And they might do more as a consequence than what Congress tells them to do. That's my hope. It's an education process. Just shoving the money over here and walking away from it doesn't build up an interest in that Department, and I think it needs it.

Q. *Dr. Good, that's a pretty gloomy assessment you gave of DOD and their 6.1 program. They insist that basic research is an important function and that they're spending heavily on it. Why do you paint a starkly different picture?*

Good. Simply because even they agree that the percentage that they're spending in basic research is significantly less than it was five years ago. They tell you themselves that's true.

Q. *But the dollars are up.*

Good. If you look at the dollars, they're not up really. If you look at the percentage, it's way down. And not only that. Take ONR [Office of Naval Research], which was an agency that understood basic research, was really heavily committed to it. You look at the programs they now fund as 6.1 kinds of things, and you compare those titles with what they funded as 6.1 five years ago, and you're going to find a very interesting change. They now look like what was five years ago 6.2 [the DOD budget category for projects tending toward applied research]. And it's very difficult to get a fundamentally basic new idea funded by those agencies. They just feel that they need to have things that are more focused, that are more clearly defined as part of their mission.

Q. *Does the [Defense Department's] University Research Initiative [URI] make up for that to some extent?*

Good. I don't know that we've actually really evaluated that. I doubt that it does, because it's not very large [$95 million in this fiscal year]. That's a small sum of money. To be honest with you, I don't think we've really evaluated that Initiative to see precisely what is actually in it. Probably would be worthwhile to do.

Bloch. Also, it's in a very narrow area. It doesn't support individual investigators, for instance. [Actually, it does on the style of NSF project awards—editor's note].

Good. That's correct. It's more of a commitment to infrastructure maintenance.

Bloch. It's not a big program. Certainly not what it was advertised to be originally. It got scaled back time and time again.

Q. *Mr. Bloch, you said in a speech earlier this year that DOD is getting a "free ride" on basic research [SGR, February 15].*

Bloch. Correct. That's what I think. Getting a free ride, because they need that [scientific] information, they need that basic knowledge. They also need the educated people. And they're not supporting it, except now for those $10 million [for fellowships]. We're talking about small programs in DOD, very small programs on graduate fellowships. That's why I said they're getting a free ride.

Q. *I'm surprised that you say you're not familiar with what the University Research Initiative is doing. Isn't there coordination between NSF and Defense in supporting research in universities?*

Bloch. Is there coordination? I would say not in a direct way. We know in general what the program does. They don't keep track on a daily basis with what we're doing. We're not keeping track of them. At times, we have tried to interest them in some of the ERCs [Engineering Research Centers] proposals which we got. We have co-funded a couple of them with NIH [National Institutes of Health], not with DOD. So, there is talk back and forth. But it's their program.

Q. *If the Defense Department is supporting something at a university, are you aware of it in any systematic way?*

Bloch. Absolutely.

Good. Sure.

Bloch. We know what is going on. Also, in the proposals we're getting in, that's one of the questions.

Q. *You're aware of it, not because of DOD, but because the universities are telling you about it.*

Bloch. Sure.

Q. *Does DOD tell you?*

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. . . NSF to Move Cautiously on New Facilities Program

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Bloch. We have meetings with DOD people from time to time. We discuss joint kinds of programs. Not the URI program in particular.

Q. *You left the impression before that you're not familiar with what DOD is doing in support of basic research.*

Good. If we left that impression, I don't think we intended to.

Bloch. No. Not quite. You asked us if we knew about the URI program, and my interpretation of that question is: do we know it in great detail? I can't recite where the URIs are located.

Q. *Now that Congress has authorized NSF to provide support for building and renovating university research facilities, have you changed your position? [Bloch, in accord with the White House position, testified against the program (SGR, July 1, 1987). Though authorized, it has not received an appropriation].*

The Planning Process

Bloch. The NSF authorization bill provides for a facility component. It also asks that we define, first of all, the role of the federal government, plus the other actors in it, and come forward with a plan. We're going to do that. And then out of that has to come some kind of an understanding on our part and what that means in terms of appropriations amounts in the following years. But I think we should go through it in an orderly fashion. We just finished a new survey [*Scientific and Engineering Research Facilities at Universities and Colleges* (NSF 88-320), available without charge from: NSF, Division of Science Resources Studies, Washington, DC 20550; tel. 202/634-4664]. I come to the same conclusion I came to in the past. There's a lot going on [in construction at universities] without the federal government's participation, both from the states and the private sector. There are also problems out there, very clearly. So, I think in the end, we have to look at what the right balance is and what we should be doing. We want to go through a planning process, as we were asked to do. We're going to use the survey as a base. Then we'll see what we want to do from there on.

Q. *Between what's being ladled out by the states and through pork-barrel appropriations, the real gap seems to be in instrumentation.*

Bloch. We have focused on instrumentation over the last few years very extensively in our programs. Deliberately. After [support of] people, it's the next important subject. I think the noise you hear today about instrumentation is a lot lower than it was three, four years ago. Do we have still a deficiency there? Absolutely.

Good. I think, though, the scientific enterprise, by definition, will always have a deficiency in equipment, because the whole issue is moving so fast that what you bought two years ago is obsolescent, and obviously those guys working the interface would very much like to have whatever the latest tool is. That's just a fact of life, and it's going to be there. But I think Erich is absolutely correct. The pain from the community over equipment, although not gone, has surely improved.

Bloch. Other agencies have done the same thing.

Good. That's also true. That's an area where the DOD did put a small program. We had hoped it was going to be much bigger, because when they first started talking about it, it was a much bigger number than they finally came to fund. But even so, it certainly helped.

Q. *[by Seishi Koizumi, a reporter from the Japanese newspaper* Yomiuri Shimbun*]: To diminish the so-called science and technology friction, you have a special program of Japan initiatives [to encourage working visits to Japan by American researchers]. But I've heard that very few American scientists apply for them. Actually, they didn't want to go to Japan. How do you explain that?*

Bloch. Wait a minute. First of all, we don't have the program to reduce friction. We have the program because we think it's very important that we give our researchers the capabilities to work in Japanese laboratories and find out what goes on there and at the same time contribute, just like Japanese researchers work in our laboratories. That's the reason for it, not to reduce friction. The second thing is that we're starting with these programs and we have sent out something like 3000 pamphlets of various sorts. We have had 2000 inquiries, which is a pretty good sign. We have to see yet what the results will be—how many will go over there. We want to make sure that we get the right takers and enough takers. Language is a problem; also uprooting the family. And there is a reentry problem back into the laboratories here. I just want to make sure that everybody understands what the possibilities and opportunities are and make sure that we get enough people interested in it so that we can send the right people over there so that we benefit from it as we should.

IOM Signs Pact with Soviets

The Institute of Medicine and the Soviet Academy of Medical Sciences signed an agreement last month to cooperate in research on polio, alcoholism, AIDS, and radiation effects. The signing took place at a meeting in Washington of delegations headed by Valentin I. Pokrovsky, President of the Soviet Academy, and Samuel O. Thier, President of the IOM, part of the National Academy of Sciences.

New Anti-Fraud Post Proposed in Draft of House Bill

When the 100th Congress adjourned last month, staff work was proceeding on legislation to establish a federal supercop to patrol against misconduct and fraud in government-supported biomedical research. In the rush and turmoil of the closing days, time ran out before the bill was completely drafted, and it was not introduced. Nonetheless, the Washington biomedical-policy establishment is horrified by the fraud issue's embodiment in a harsh legislative proposal, which is sure to arise in the next Congress.

Drafted as an amendment to the Public Health Service Act, the legislation would establish an "Office on Scientific Integrity" in the Department of Health and Human Services (HHS), parent agency of the National Institutes of Health (NIH). The basic goal—a stricter, less trusting approach to science's self-policing of delinquency—has the support of three influential members of the House Energy and Commerce Committee, which writes the basic legislation for NIH: Chairman John Dingell (D-Mich.), impresario of a scientific misconduct hearing last spring that was deeply embarrassing for NIH (SGR, April 15); Henry Waxman (D-Cal.), Chairman of the subcommittee that deals most directly with NIH, and Ron Wyden (D-Ore.), who has chosen medical misconduct as an area of special interest. The expectation is that when Congress convenes next year, some form of the bill will be introduced and pushed for passage.

The proposed legislation proceeds from a distrustful assessment of science's capacity to deter misconduct and identify and weed it out when it occurs. The proposed Office on Scientific Integrity would be headed by a Director appointed by the HHS Inspector General, a position for which a mentality of cop and overdue-bill collector is a dual prerequisite. There's some safeguard in a requirement that the appointment must be approved by the HHS Secretary, but that's no guarantee of a gentle hand or a sensitive approach.

Appended to the Office would be an Advisory Council whose diverse membership, the draft amendment specifies, would include "junior research scientists"—a group known to harbor some grievances about the distribution of work and reward on the plantations of science.

Under current NIH practice, the burden for investigating a fraud charge is on the institution where the alleged offense occurred. The draft bill states that the institution must "respond promptly and appropriately to any allegations of scientific misconduct," but the bill's main emphasis is on the role and powers of the Office on Scientific Integrity.

The task of the Director of the Office, the draft states, is to "investigate scientific misconduct" and to "deter scientific misconduct." To accomplish this, the Director is authorized "to establish a process for receiving allegations of scientific misconduct" and to conduct investigations, "including onsite investigations." In addition, the Director is to develop procedures "for preventing inappropriate retaliation against any person making such an allegation."

When the Director believes a culprit has been nailed, he's authorized to recommend various penalties to the HHS Secretary. These include cutoffs of funds for the suspect research and loss of eligibility for applying for more, plus "disallowance" of the project's indirect-cost payments at the offender's institution.

The proposed legislation would also require institutions to adopt several procedures as a condition of receiving HHS research money. Among them is a requirement for sending the Office on Scientific Integrity a semiannual report of "all allegations of scientific misconduct." In addition, the amendment provides for immunity against "any private civil action" arising from accusations of scientific misconduct, unless the accuser knew they were false. To complete the nightmare, the HHS Secretary "shall develop guidelines for use by scientific journals to protect against publication of manuscripts with respect to which there has been scientific misconduct."

While the the House legal draftsmen work on a statutory approach, HHS is inviting public comments on the latest product of interminable efforts to devise "Regulations Protecting Against Scientific Fraud or Misconduct." Applicable to research supported by the Public Health Service, which means mainly the NIH, the proposed regulations have over the past three years bounced between NIH, HHS, and the Office of Management and Budget. OMB rejected the last version on the grounds that it would have a stultifying effect on research.

The current rendition, published in the September 19 *Federal Register* (P. 36344), gingerly approaches the subject, which it addresses under the general label of "scientific misconduct." It states that the issues and problems associated with misconduct are "complex and controversial" and "warrant a carefully considered open dialog with all affected parties." The underlying tone of the invitation for comments and the proposed regulations is strikingly different from the legislative draft in the House. HHS looks to the universities as the main enforcers of scientific integrity, whereas the House draft focuses on establishing strong enforcement powers within the federal government.

HHS, in inviting comments, states that a possibility under consideration calls for giving the HHS Inspector

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. . . Department Seeks Comments on Its Fraud Regulations

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General "complete and exclusive authority to investigate allegations of scientific misconduct, and to monitor" investigations at grantee institutions. That approach, however, is so offensive to the NIH style of operation that it is doubtful that the Department would try to inflict it on Bethesda or that OMB would let it.

The House draft proceeds from the assumption that fraud and deceit are no rarities in the conduct of research. The HHS approach suggests a faith that transgressions are rare but must be more directly addressed because they erode public support for science. The *Federal Register* notice states, "In fact, since 1980, the frequency of allegations of misconduct reported to the National Institutes of Health has remained relatively constant . . . . Nevertheless, even a small number of instances of scientific misconduct is considered a threat to the continued public confidence in the integrity of the scientific process and in the stewardship of Federal funds. The traditional safeguards such as peer review and guidance from professional organizations must be supplemented by explicit institutional commitment to high ethical standards in research."

While Congress and HHS are seeking to deal with the issue, the science establishment is stirring—though mainly in response to fears of public perceptions, rather than a conviction that serious chiseling is damaging the substance of science, not merely its image.

Two meetings to devise new standards to deal with misconduct have been held by the Conference of Lawyers and Scientists, a joint venture sponsored by the American Association for the Advancement of Science and the American Bar Association; a report is due early next year. And, on October 16-18 the Council of Biology Editors met in Washington to discuss the role they might play in assuring the purity of the literature.

Drummed up late in the session, the House bill came as a shocking surprise to the statesmen of science. In its end-of-the-session form, it was quite rough and unpolished. But it will be back next year, with all the niceties of legislative drafting properly attended to. The chances are that it will then be the subject of a public hearing, rather than slipping by as a last-minute amendment to a reauthorization bill.

The leaders of the biomedical-research enterprise consider the present bill harsh and out of touch with their community's way of doing business, and inappropriate for dealing with whatever misconduct problem may actually exist.

They must reckon, however, with Congressman John Dingell, one of the great political powers of Capitol Hill. His hearing-room encounter last spring with NIH's handling of misconduct allegations left him angry and incredulous. His staff has since borrowed the services of Walter Stewart, the NIH staff member who, along with his colleague Ned Feder, has been turning up a lot of grimy data on the ethical state of science.—DSG

In Print

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emphasis on industrial technology. But it displays the thinking of today's NSF management.

Facts About the US Antarctic Program (NSF 88-66; 17 pp., no charge), describes Antarctic research facilities and programs, for which NSF heads US activities; also includes text of 1959 Antarctic Treaty and a bibliography of maps, photographs, and publications.

Order NSF publications from: NSF, Forms and Publications, Room 232, 1800 G St. NW, Washington, DC 20550; tel. 202/357-7861.

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Harnessing the Genie: Science and Technology Forecasting for the Air Force, 1944-1986, by Michael H. Gorn, Office of Air Force History (GPO Stock No. 008-070-00615-4; 209 pp., $9), describes five major sci-tech forecasting studies commissioned by the Air Force between 1945 and 1986, noting a decline in the influence of civilian advisers as AF officers with advanced degrees rose in numbers and rank.

Order from: USGPO, Superintendent of Documents, Washington, DC 20402; tel. 202/783-3238.

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News Report, of the National Research Council ($10 for ten issues per year), produced by the research arm of the National Academy of Sciences and its satellites, the National Academy of Engineering and the Institute of Medicine; summarizes major reports from the Academy complex, lists new publications and projects.

Order from: NAS, News and Public Information, 2101 Constitution Ave. NW, Washington, DC 20418; tel. 202/334-2138.

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The following publications are obtainable as indicated—not from SGR.

Focus on the Future: A National Action Plan for Career-Long Education for Engineers (75 pp., no charge), report by the National Academy of Engineering, produced by a panel chaired by Thomas L. Martin, President emeritus, Illinois Institute of Technology, says there's "a vacuum at the national level in the engineering community" rather than an effective response to the rapid obsolescence of engineering skills. The report urges industry to devote more attention and money to updating employee skills, and also recommends roles for federal and state governments, engineering schools, and professional societies.

Order from: National Academy of Engineering, Program Office, NAS 050, 2101 Constitution Ave. NW, Washington, DC 20418; tel. 202/334-1544.

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The Science Report Card: Trends and Achievement Based on the 1986 National Assessment (17-S-01; 151 pp., $14), produced by the Educational Testing Service, latest of five assessments since school-year 1969-70 of scientific knowledge of a total of 240,000 students ages 9, 13, and 17. ETS concludes that despite some improvements, "average science proficiency across the grades remains distressingly low." In addition to test results on various subjects, the report covers teacher proficiency, classroom equipment, homework hours, and student attitudes toward science.

Order from: National Assessment of Educational Progress, Educational Testing Service, Rosedale Rd., Princeton, NJ 08541-0001; tel. 609/921-9000.

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Informing the Nation: Federal Information Dissemination in an Electronic Age (GPO Stock No. 052-003-01130-1; 333 pp., $14), report by the Congressional Office of Technology Assessment, notes that electronic formats and storage are being employed for a large and growing proportion of information compiled by federal agencies, but that public access to these federal data banks is limited, resulting in reduced dissemination of important public data. To counter the trend, OTA urges, among other steps, reworking of basic federal legislation on information policy, particularly the Depository Library Act, the Freedom of Information Act, and the Paperwork Reduction Act.

Order from: USGPO, Superintendent of Documents, Washington, DC 20402; tel. 202/783-3238.

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The Future of Electronic Assembly (80 pp., no charge, supply limited), another dour report on the state of American industry, this one by a National Academy of Sciences panel, established at the request of the Department of Defense to examine the adoption by American firms of "new assembly manufacturing technologies . . . essential for the US defense supply." The panel concluded that "The vast majority of US electronics companies are four to five years behind their foreign competitors, particularly Japanese companies, in the practice of manufacturing process control." It warns that the Pentagon "should not be unconcerned by a world split in which the Japanese dominate consumer electronics while the United States dominates military electronics." Following an increasingly popular theme, the panel, with backgrounds in industry, academe, and federal service, suggests the establishment of a big, government-supported plant to develop and demonstrate manufacturing techniques.

Order from: NAS, Manufacturing Studies Board, 2101 Constitution Ave. NW, Washington, DC 20418; tel. 202/334-2570.

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From the National Science Foundation:

NSF: A Brief History, by George T. Mazuzan, historian of the National Science Foundation (NSF 88-16; 34 pp., no charge), a big-picture review, from postwar gestation through 1985.

NSF Long-Range Plan: FY 1989-1993, (NSF 88-56; 16 pp., no charge), a wish list, already bent by Congressional balks on the budget and rendered even more uncertain by rising political pressures for greater federal

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